

Architecture Best Practices for Project and Technical Leaders

Software Engineering Institute
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Pittsburgh, PA 15213

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11/5/14



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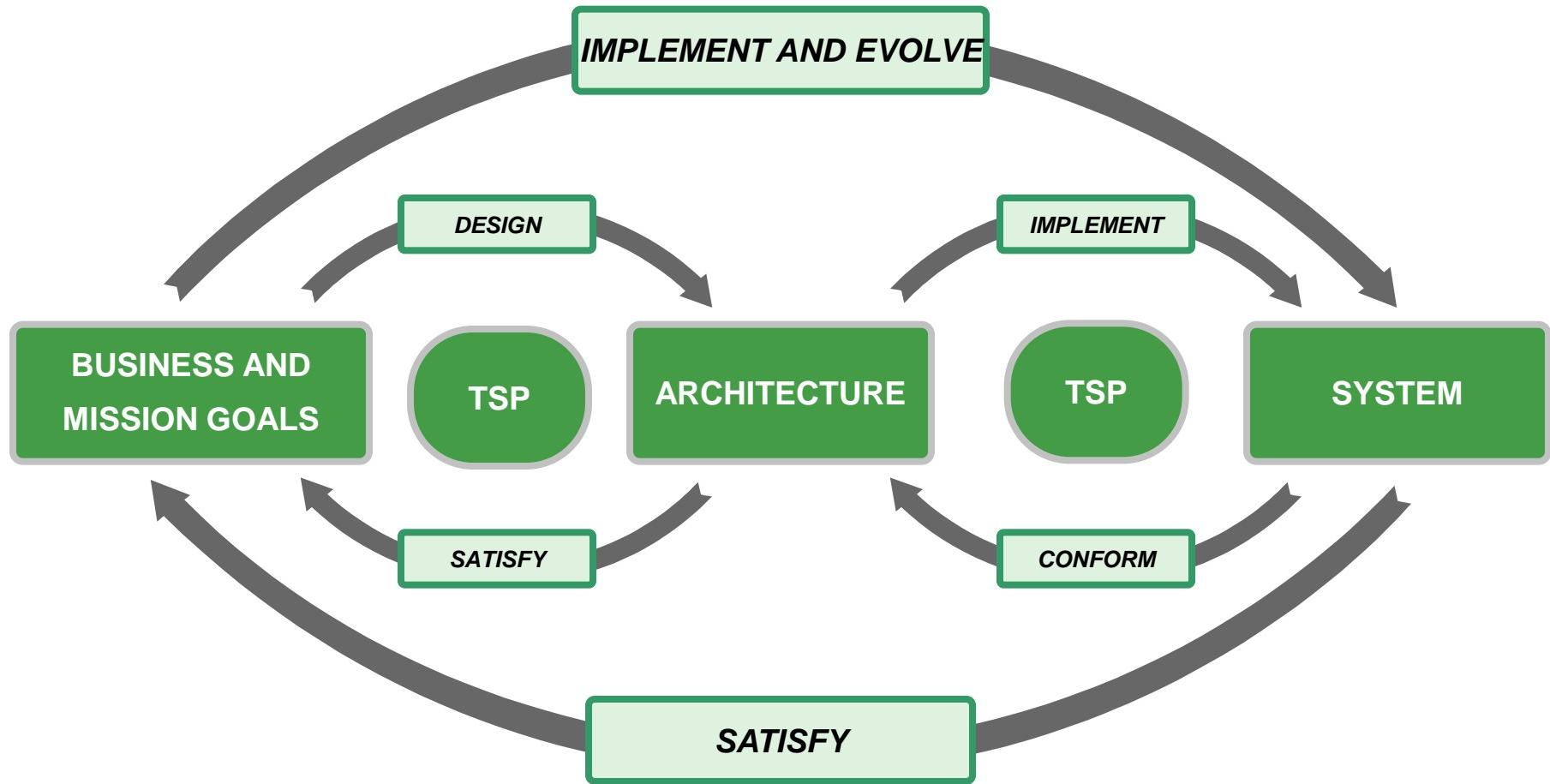
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Architecture-Centric Engineering (ACE) Design and Analysis – with TSP



What Drives Architectural Need?

There are no definitive studies or guidelines, probably because the answer is context dependent.

- More than 2 people
- More than 6 months effort
- More than 25-30 KLOC (thousands of lines of code; a VERY high number for 2 people over 6 months)
- Critical non-functional attributes (performance, safety, security, etc.)
- No pre-existing architecture!* (...especially if someone other than the developer is attempting to maintain or enhance it)



Why is Architecture Needed?

Represents *earliest* design decisions



- hardest to change
- most critical to get right
- communication vehicle among stakeholders

First design artifact addressing



Quality attributes (i.e., performance, security, usability)

Key to systematic *reuse*



- transferable, reusable abstraction

What do I need to know?



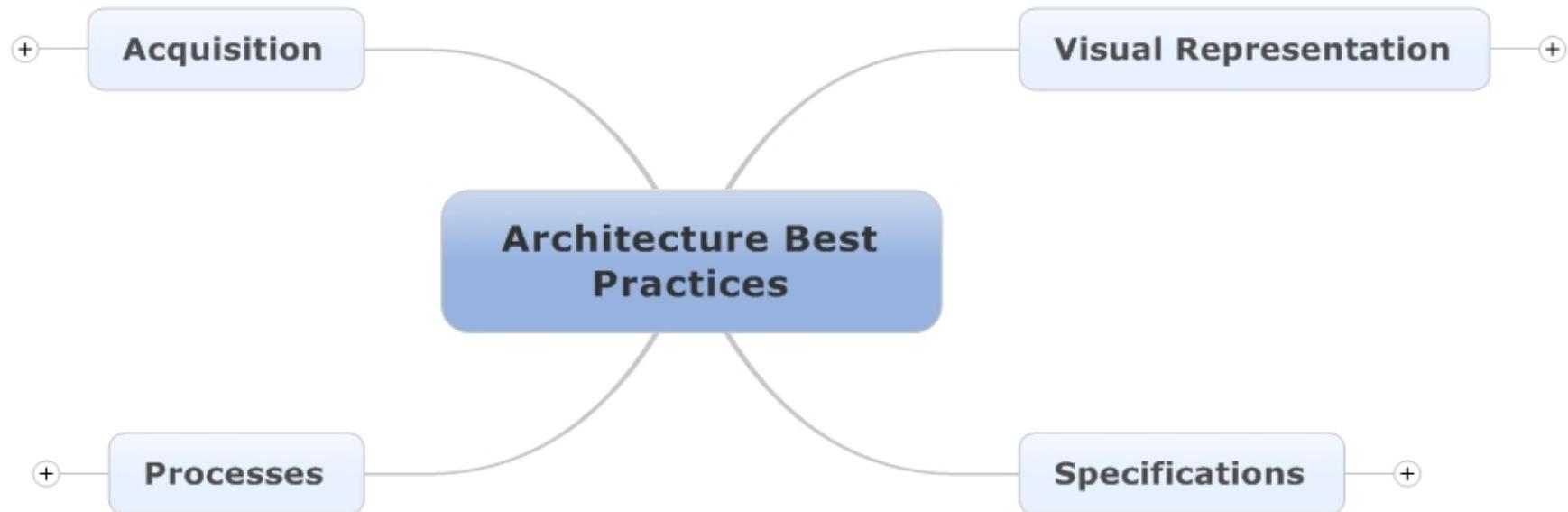
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Key

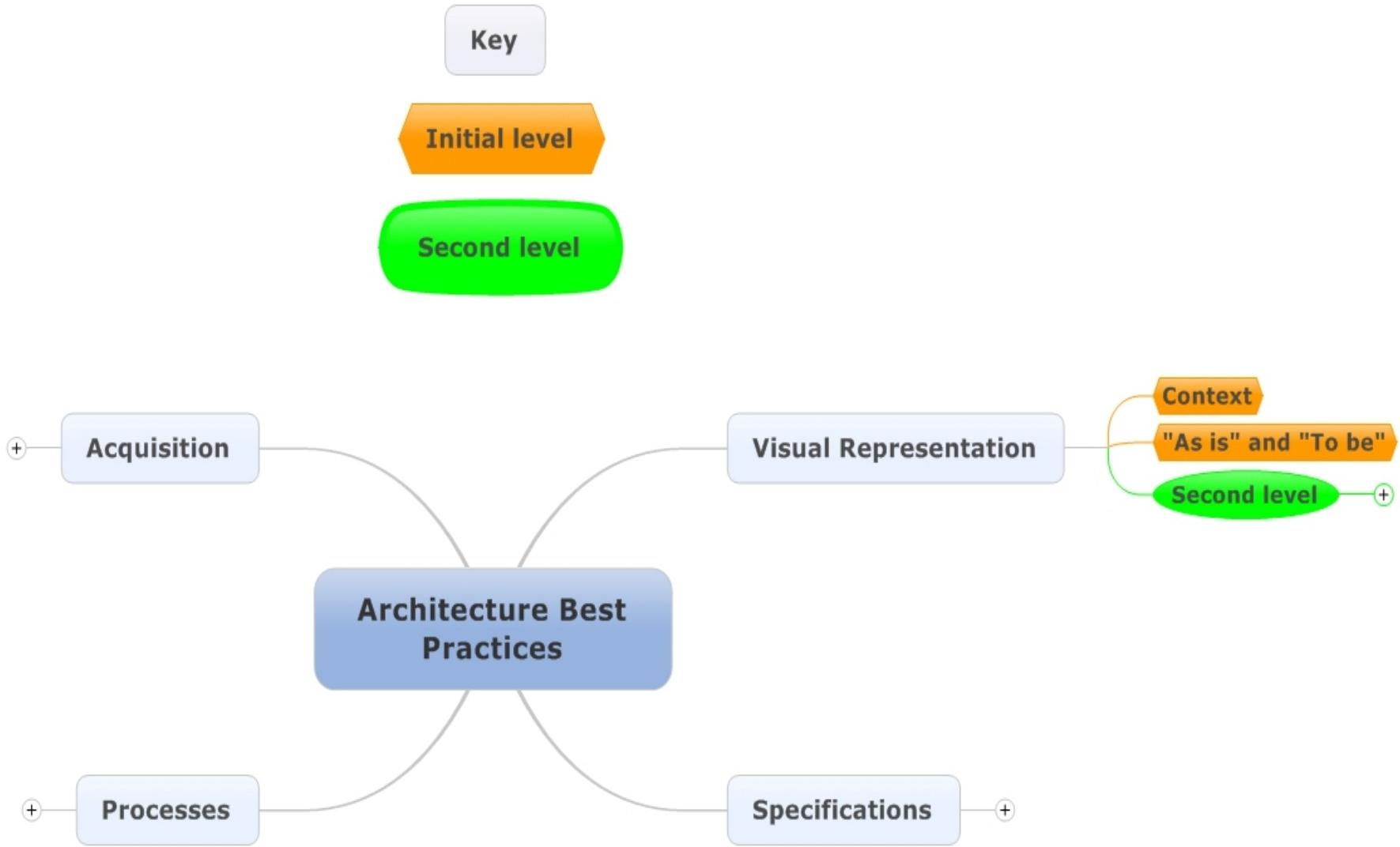
Initial level

Second level

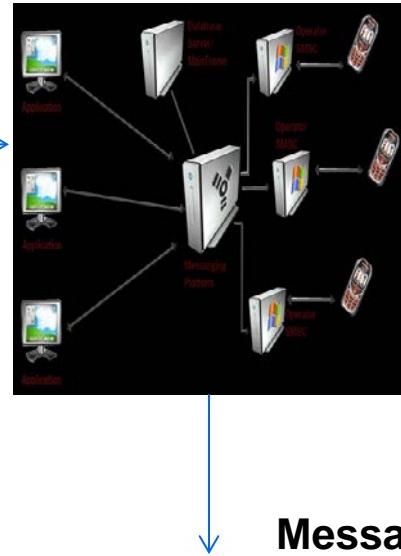
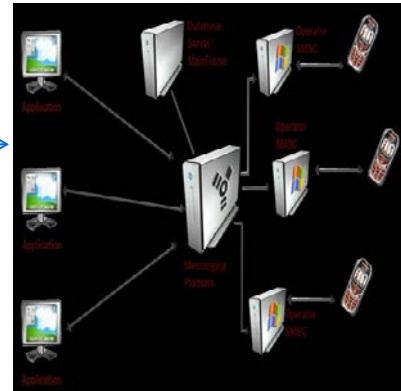


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First
Responders



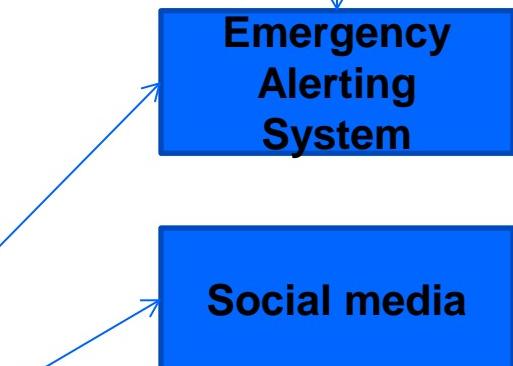
Message
Recipient

Local
govt

Emergency Management
Organization



Citizen calls 911



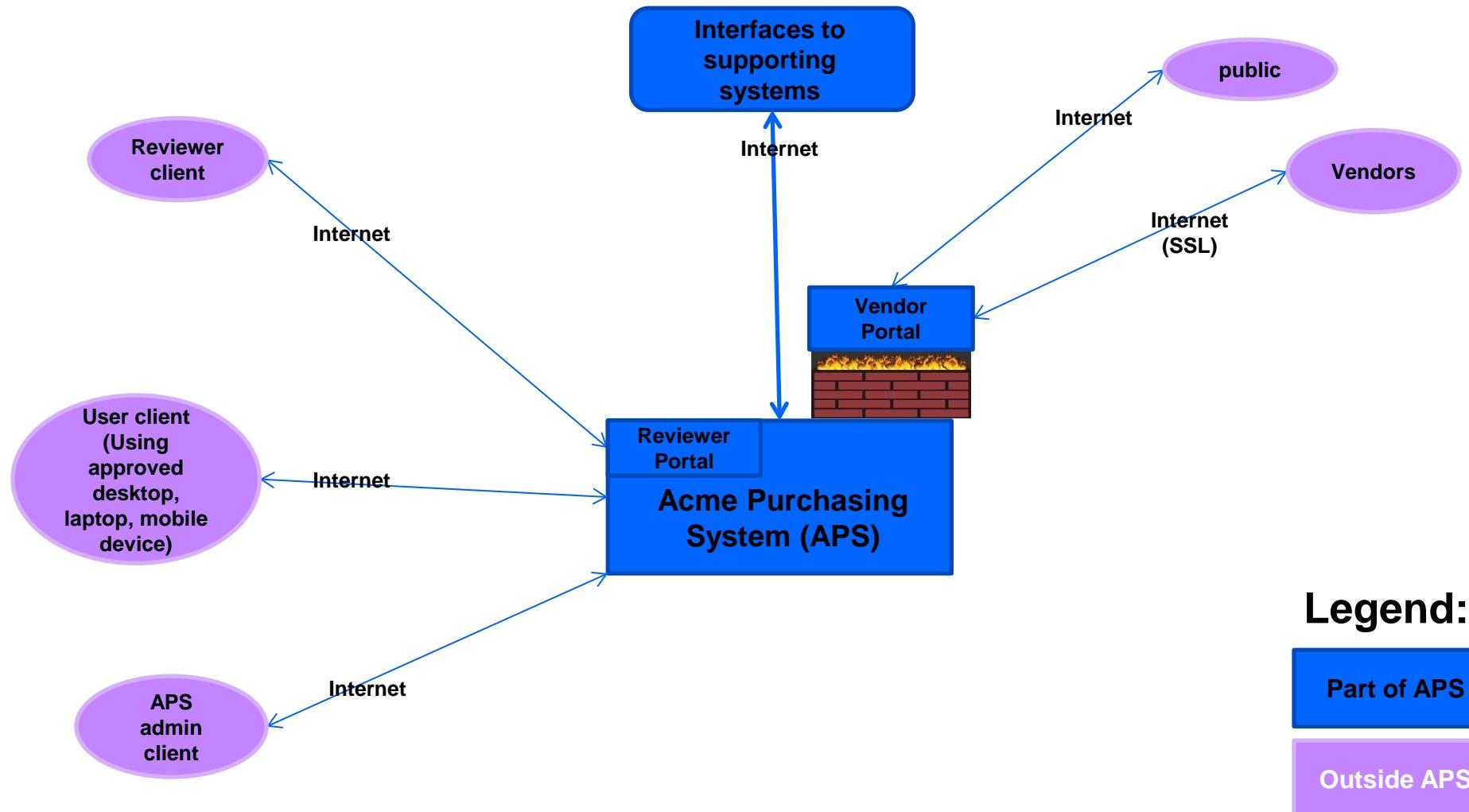
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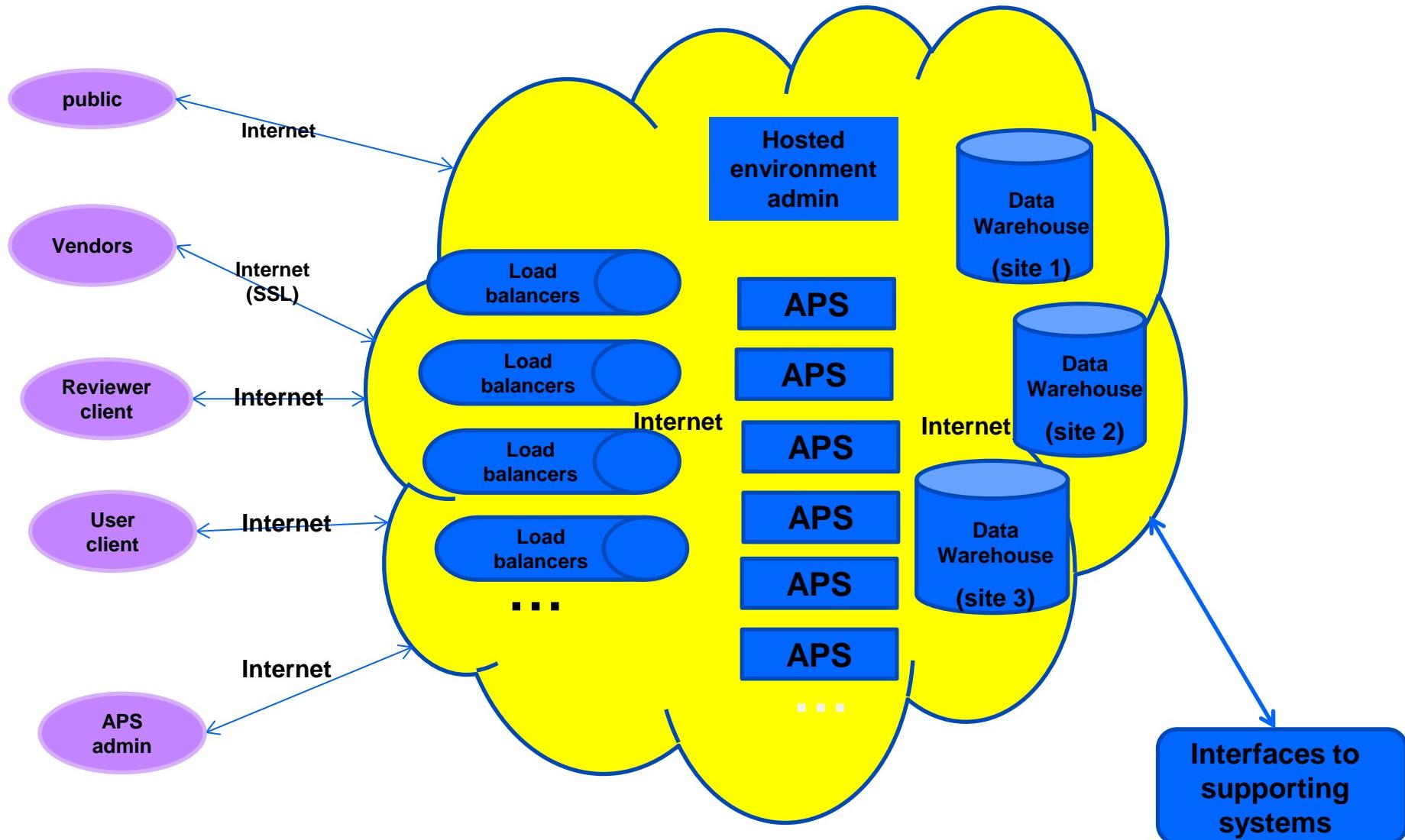
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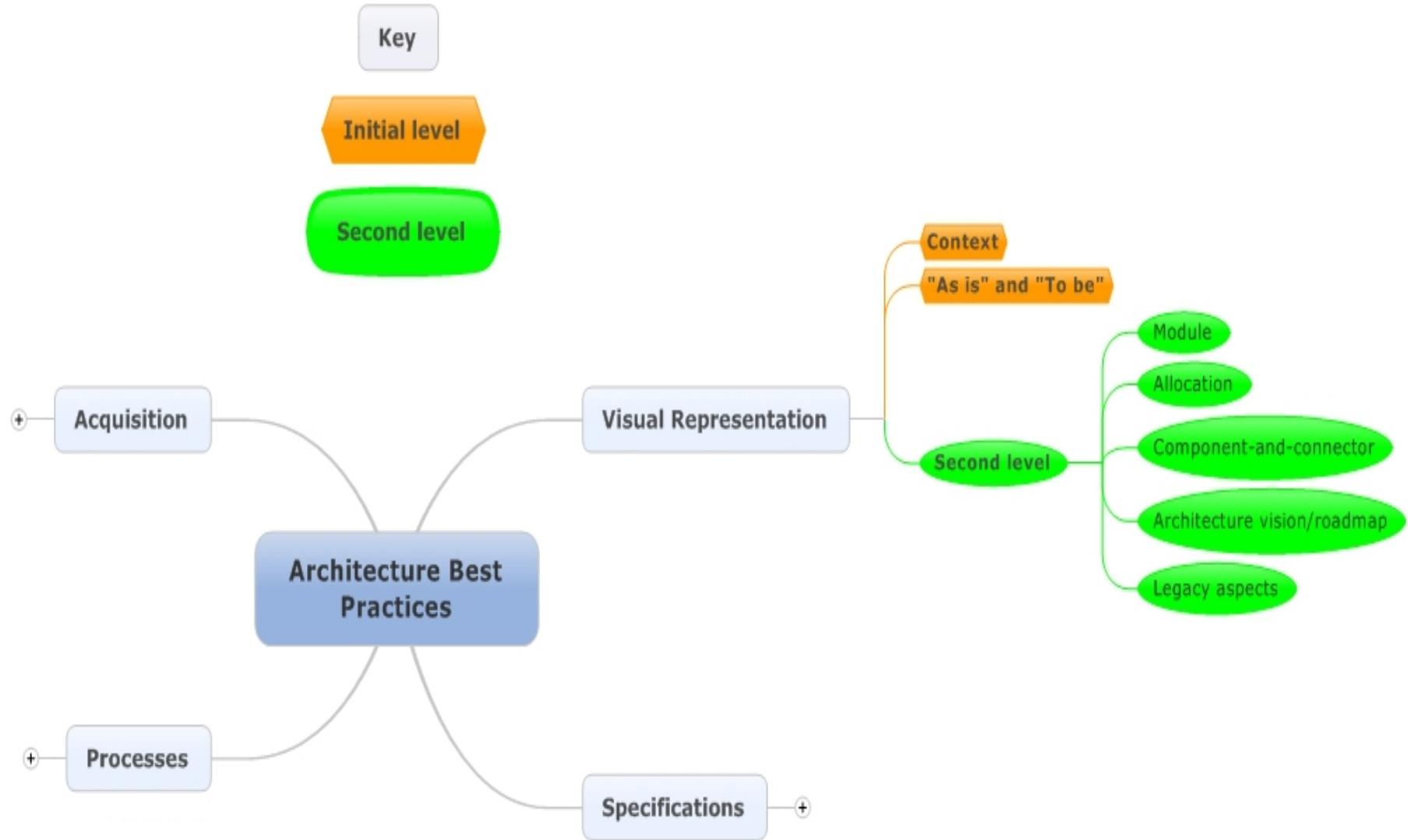
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“As-Is” Standalone Implementation

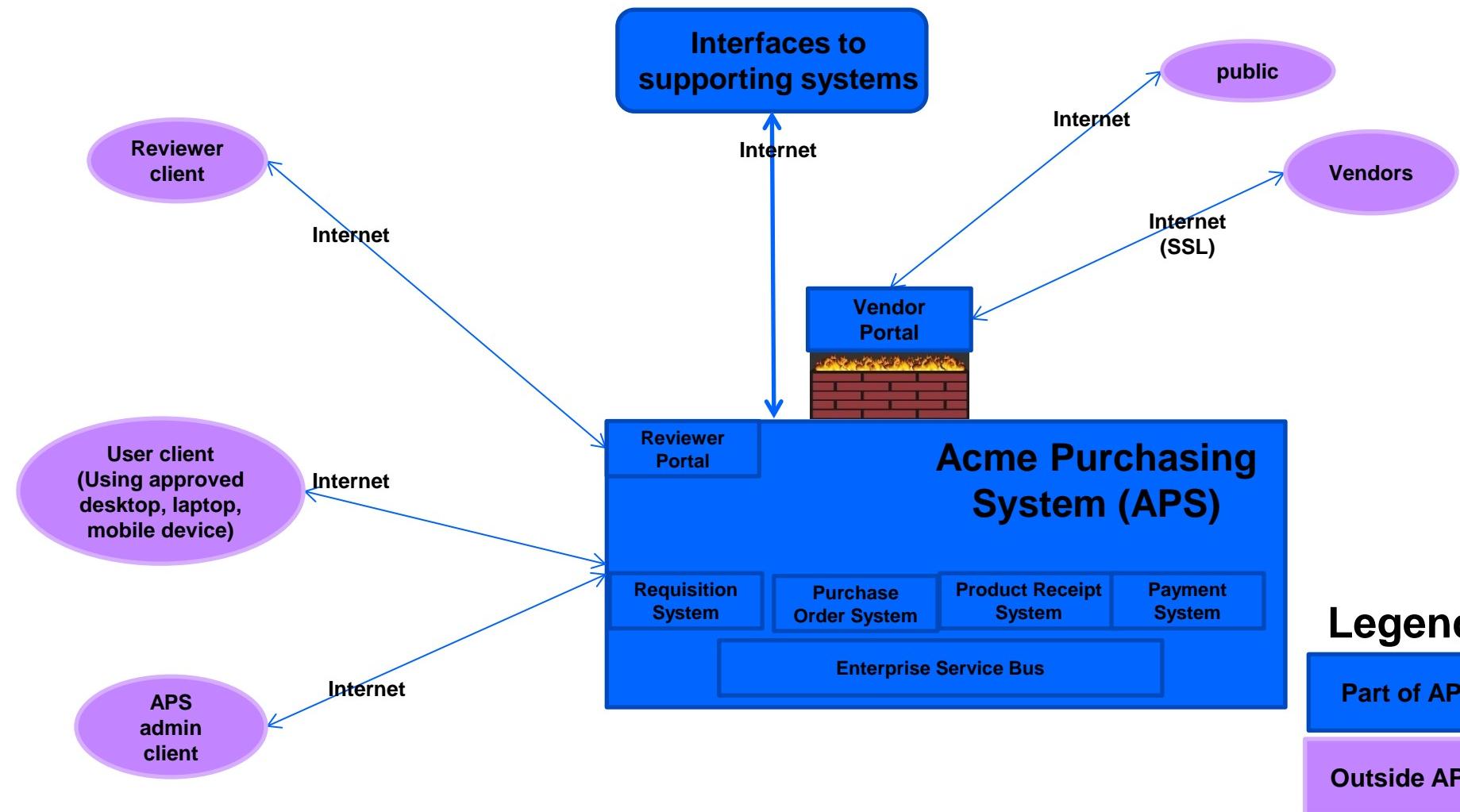


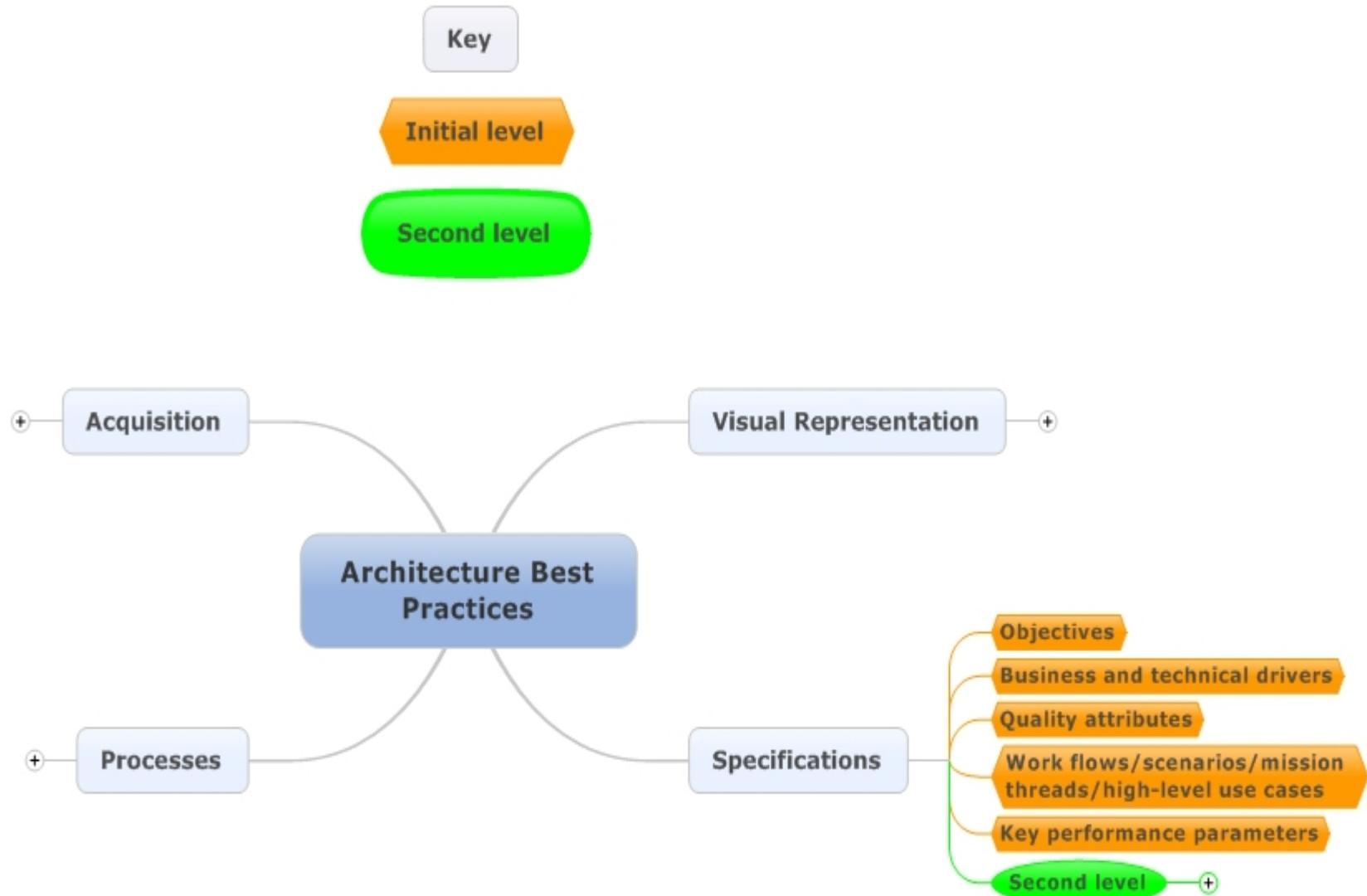
“To-be” Hosting view

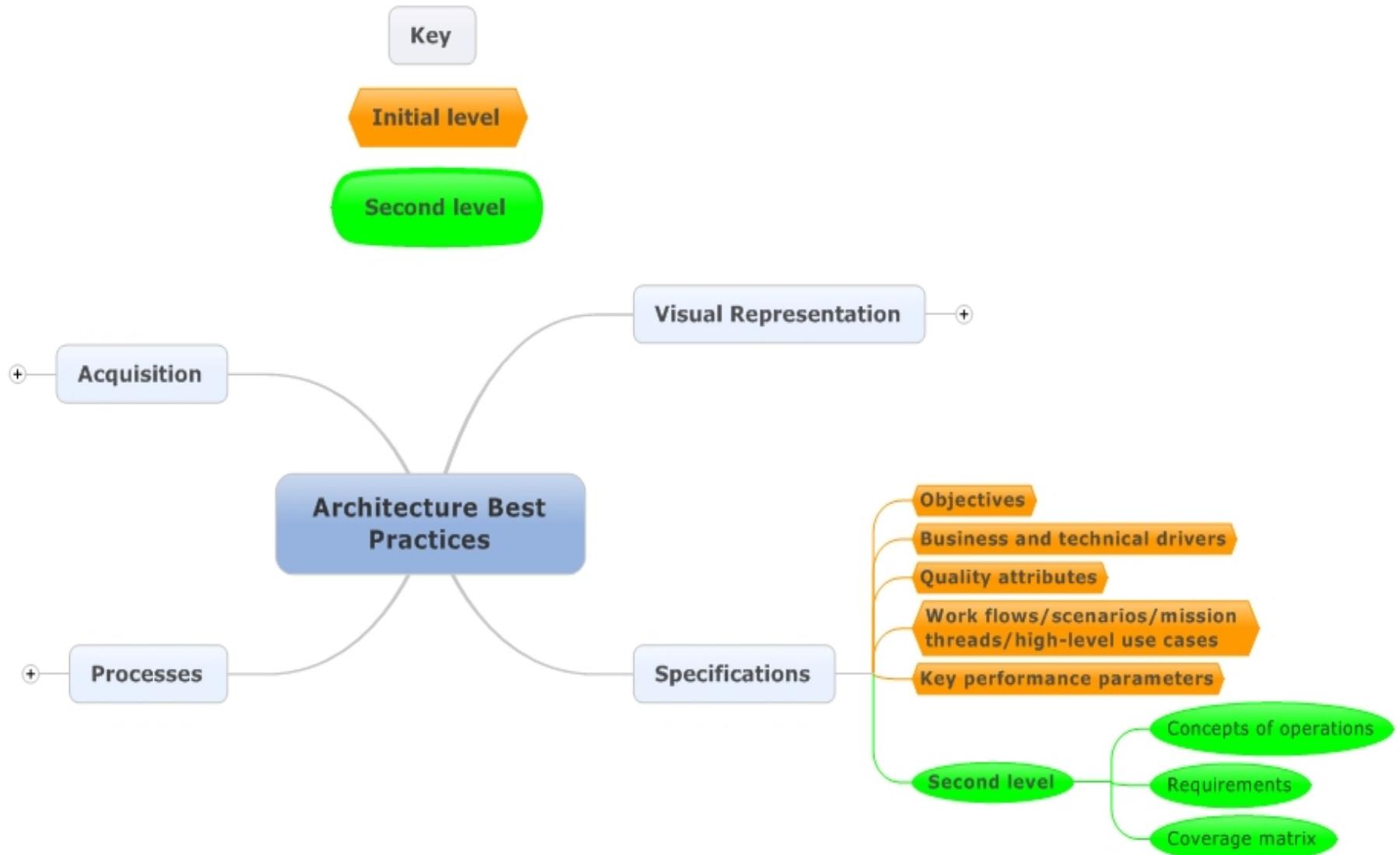




APS Decomposition View





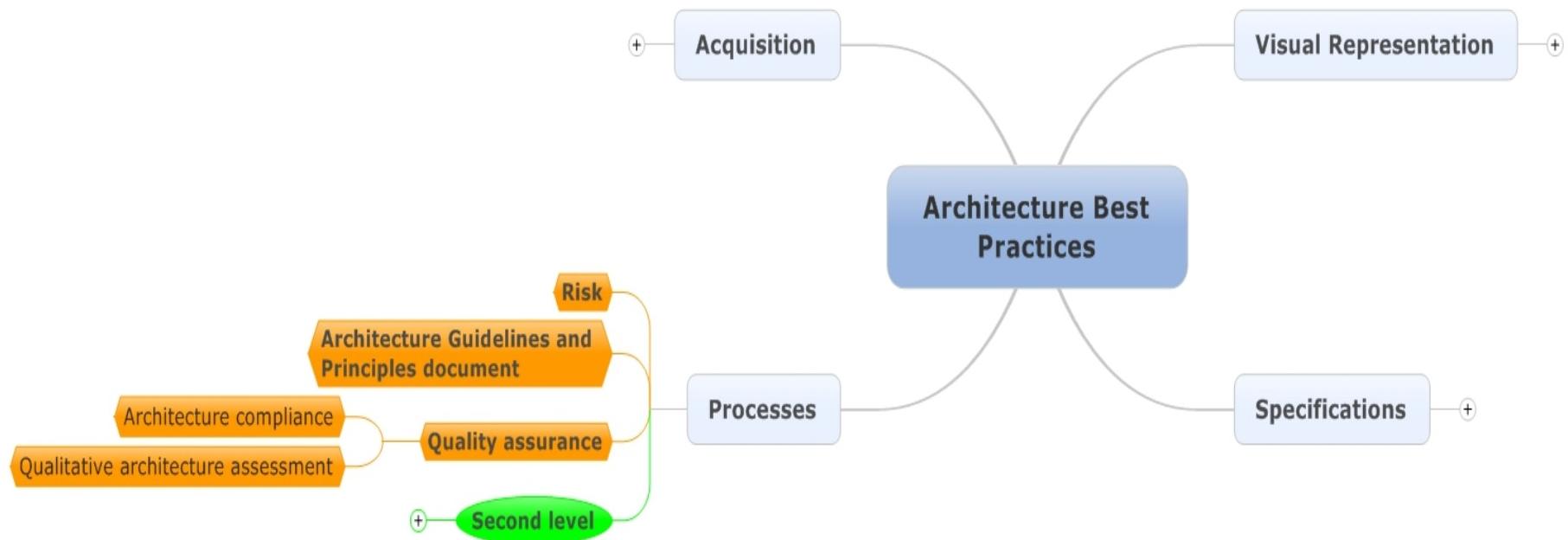




Key

Initial level

Second level



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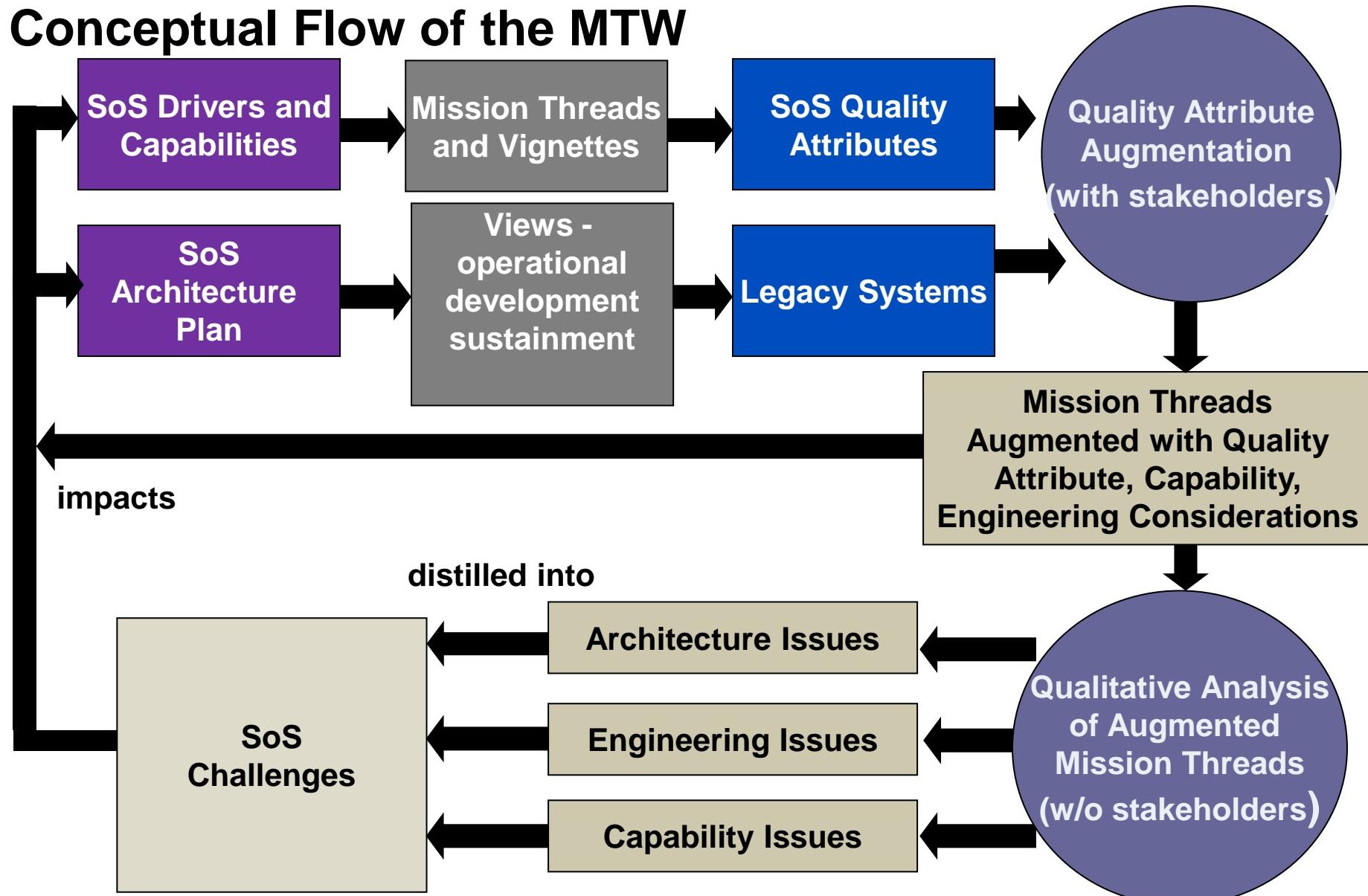
Architecture Guidelines & Principles Document

Table of Contents

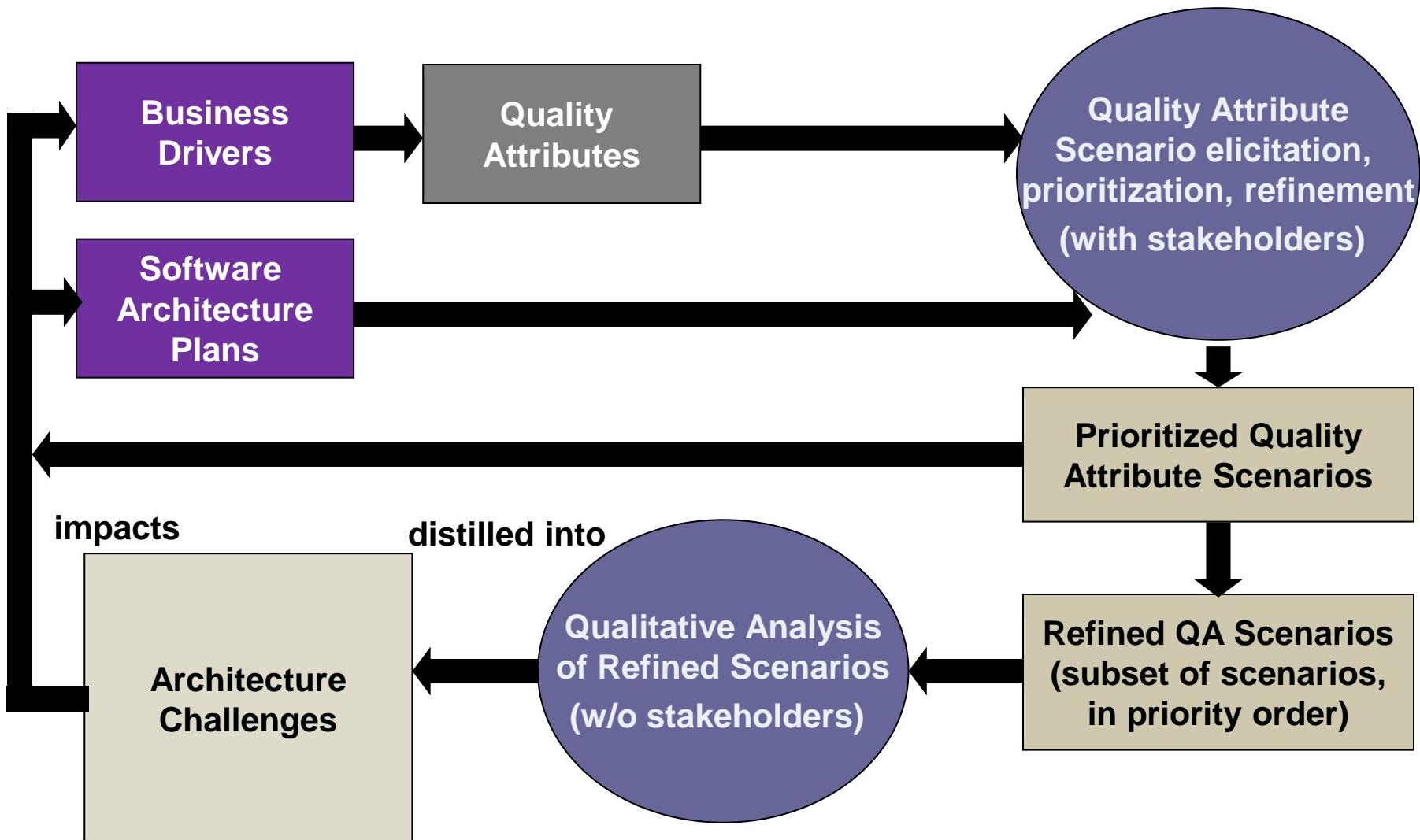
- Timeline
- Quality Attributes
- Guidelines
- Strategies
- Constraints
- Design/Coding Guidance
- Architecture Evolution
- Decisions

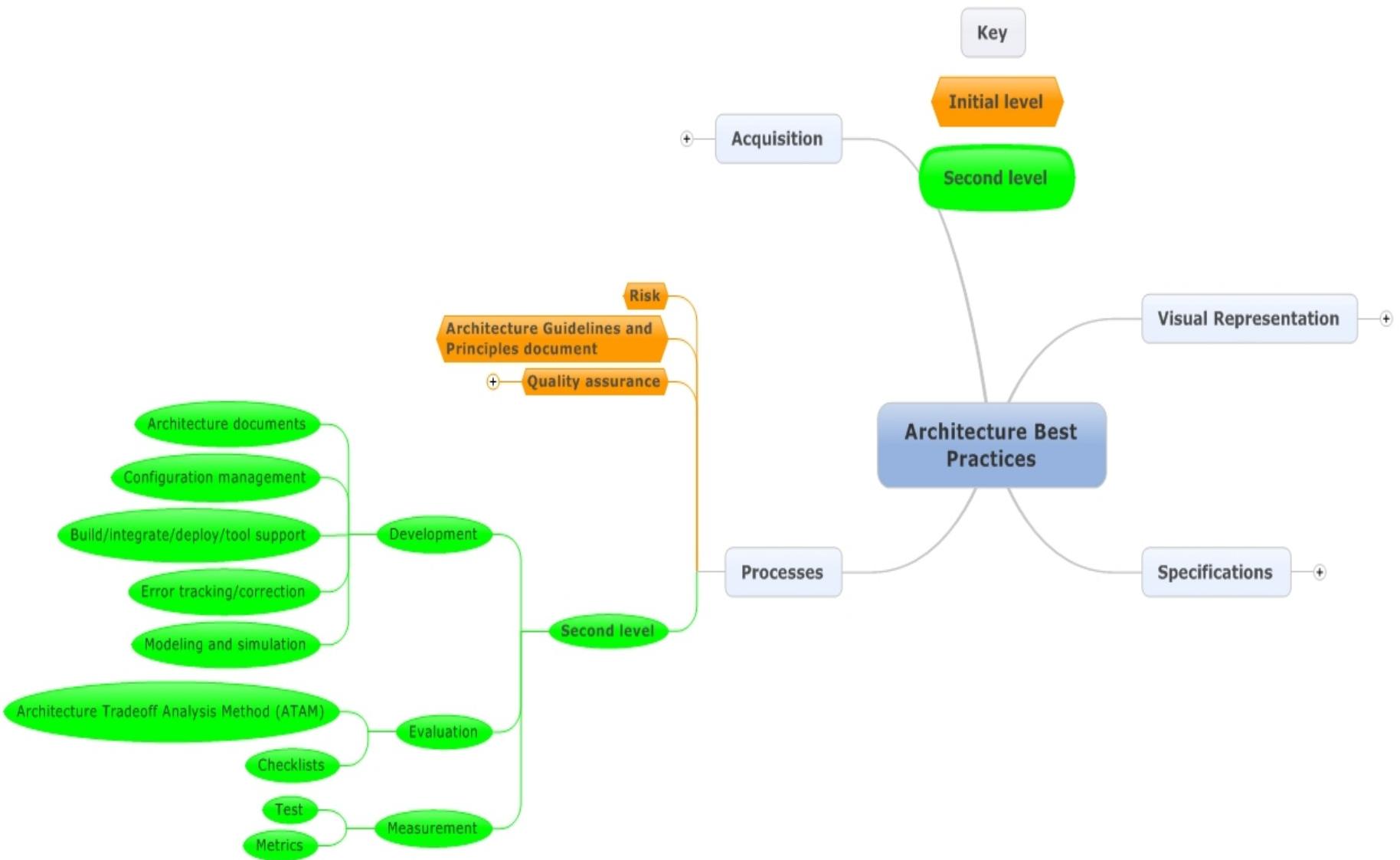


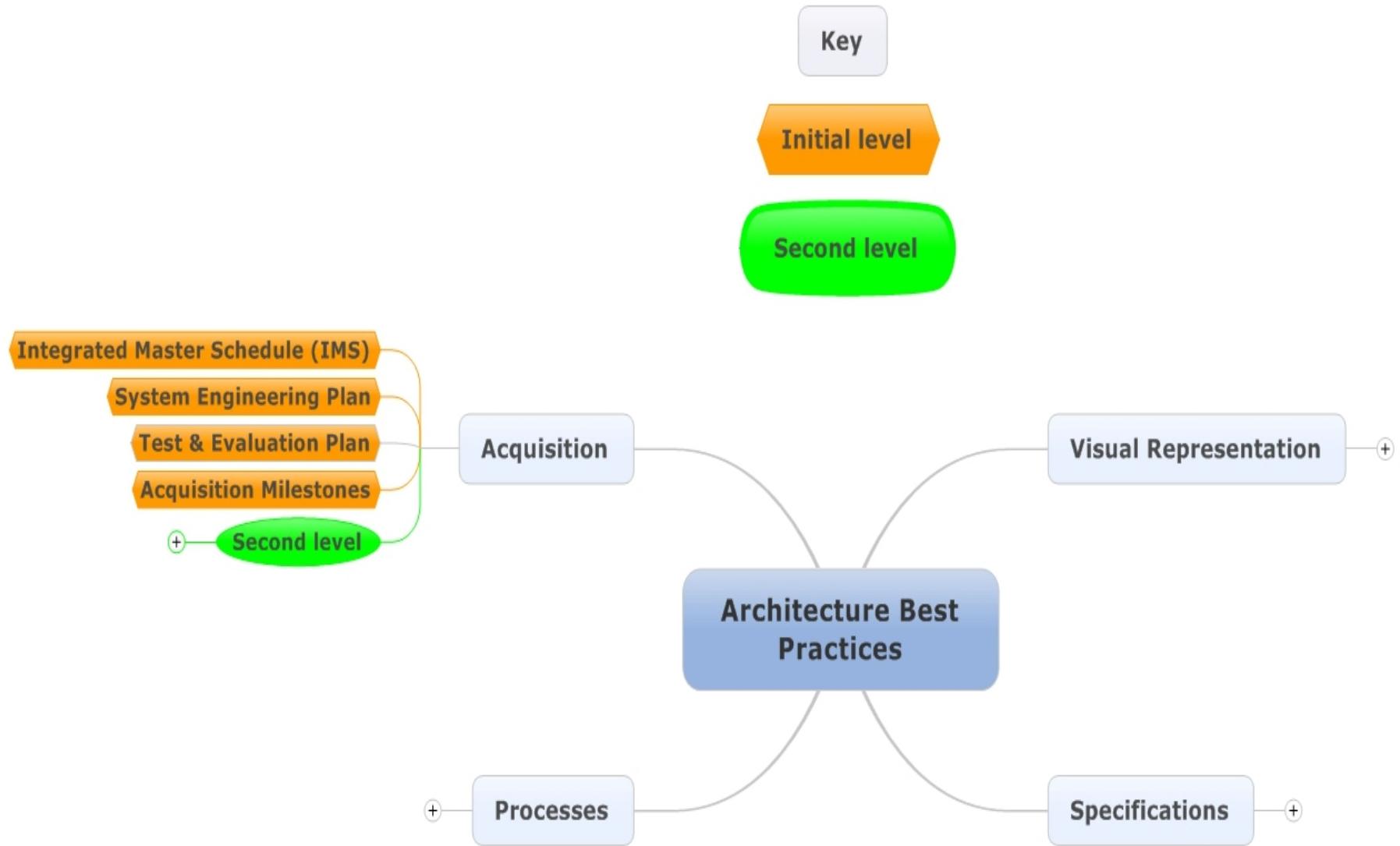
Conceptual Flow of the MTW

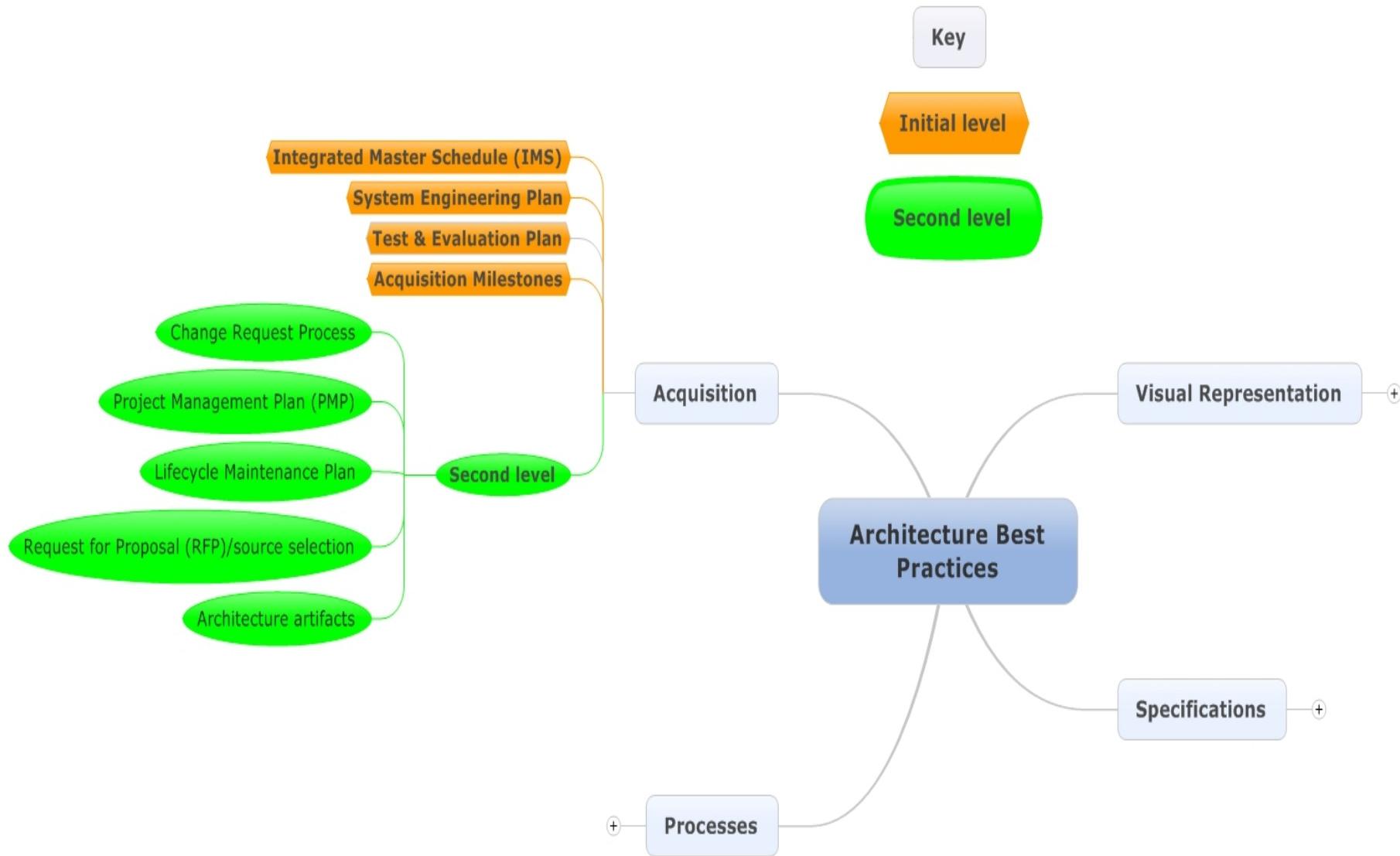


Conceptual Flow of the QAW









System Engineering Timeline



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